Stable N-acetylated analogs of Sialic Acids and Sialosides

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ABSTRACT

Researchers at the University of California, Davis have constructed a library of glycans containing N-acetyl sialic acids to mimic those containing naturally occurring O-acetyl sialic acids.

FULL DESCRIPTION

O-Acetyl modifications of sialic acids affect the key roles that sialic acids play in biological and pathological processes including immunology, oncology, virology, and neuroscience. However, these modifications are unstable and can be hydrolyzed easily by pH changes or the presence of esterases. This lability of sialic acid O-acetylation has hindered its functional study and application.

Researchers at the University of California, Davis have developed an efficient method to construct a library of glycans containing sialic acids with one or more N-acetyl groups as mimics of those containing the natural occurring O-acetyl sialic acids. Glycans containing azido derivatives of legionaminic acid and sialic acids have also been produced. Molecular dynamic simulations proved that the glycans containing N-acetyl sialic acids have comparable conformation and flexibility to those containing O-acetyl sialic acids. Due to this similarity, sialic acids with N-acetylation can both be recognized and taken up by cells while also being more resistant to hydrolysis. These N-acetyl analogs provide a more viable reagent for biological evaluation and application of naturally occurring sialic acids and sialosides. These analogs can also be used to generate monoclonal antibodies in therapeutic applications and for detecting antibodies in patient sera as markers for cancerous or non-cancerous diseases and for bacterial infection.

APPLICATIONS

▶ Stable analogs for studying cell biology and pathology of sialosides, especially those containing labile O-acetyl modifications
▶ Studying the function and importance of sialoside modifications

FEATURES/BENEFITS

▶ Stable/viable analogs
▶ Mimic naturally occurring O-acetyl sialic acids
▶ Similar comparable conformation and flexibility as O-acetyl groups.
▶ Increased resistance to hydrolysis

PATENT STATUS

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OTHER INFORMATION

KEYWORDS
sialic acid, N-acetyl analog, O-acetyl sialic acid, carbohydrate, chemoenzymatic synthesis, legionaminic acid, sialosides

CATEGORIZED AS
▶ Materials & Chemicals
  ▶ Biological
  ▶ Chemicals
  ▶ Other
▶ Research Tools
  ▶ Antibodies
  ▶ Nucleic Acids/DNA/RNA
  ▶ Other

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